INSECTS OF MICRONESIA

Diptera: Tephritidae[1]

By **D. ELMO HARDY**

Entomologist, Hawaii Agricultural Experiment Station

and

MARIAN ADACHI

Research Assistant, Hawaii Agricultural Experiment Station

The fruit flies of Micronesia have received little attention in the literature. The only taxonomic work which has been done is that of Malloch in "Insects of Guam" (1942, B. P. Bishop Mus., Bull. **172**: 201-205) and of Swezey (1946, B. P. Bishop Mus., Bull. **189**: 195-200). Other than those reports there is scarcely any information on this group except for brief mentions of the presence of the Oriental fruit fly by Monzen [1938-1939, Oyo Dobutsu.-zasshi **10** (3-4): 142-145] and Shimizu [1935, Gunto no Sangyo **5**(7): 1-16] and a few records of the fruit flies of Guam by Beller (1948, U. S. Dept. Agric., Div. Foreign Plant Quarantine, Honolulu) and Oakley (1939, unpublished material). The group is rather poorly represented in this region, and there is a scarcity of representatives of a number of the species. In the collections available for study there is little reared material. Most of the collecting has evidently been done by sweeping since the flower-head infesting species were most commonly taken.

Little biological information is available concerning the Micronesian fruit flies. The immature stages of only three of the species are known: *Dacus* (*Strumeta*) *dorsalis* Hendel, *D. cucurbitae* Coquillett, and *D. frauenfeldi* Schiner. The larvae of the first two have been adequately described in the senior author's "Studies in Hawaii fruit flies" [1949, Ent. Soc. Washington, Proc. **51**(5): 181-205, 57 figs.]. *D. cucurbitae* (late instars) can be recognized by the presence of a conspicuous dark-brown to black line extending transversely across the median lower third of the posterior end; this extends between the lateral gibbosities (intermediate areas). (See figure 1, *a*.) The openings of the posterior spiracles are also more elongate and slender in *D. cucurbitae*. They are about five times longer than wide. In *D. dorsalis* and *D. frauenfeldi* these openings are shorter and more broad compared to their length. *D. frauenfeldi* larvae closely resemble those of *D. dorsalis*. In fact, in most details they are almost alike. They differ in having the mouth hooks more

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blunt and rounded (fig. 1, *d*), not sharp-pointed and slender (fig. 1, *c*); and the anterior respiratory structures are about twice the size of those of *D. dorsalis* and have much smaller, more inconspicuous and more numerous lobes. They have about two dozen lobes (fig. 1, *g*), rather than nine or 10 (fig. 1, *e*), on the anterior margin of the spiracle. The anterior spiracles are rather similar to those of *D. cucurbitae* but are broader and have more apical lobes. (See figure 1, *f*, *g*.) A simple character which can be used to differentiate *D. frauen-*

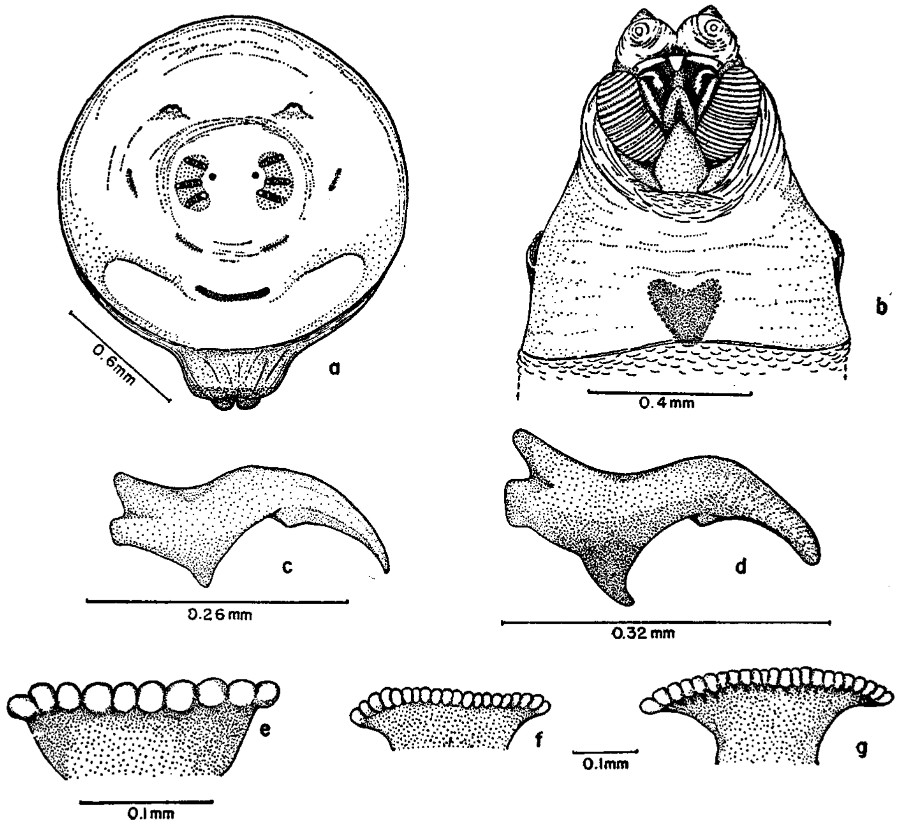


FIGURE 1.—Larval characters. **a, f,** *Dacus cucurbitae: a,* posterior end of larva; *f,* anterior respiratory structure. **b, d, g,** *D. frauenfeldi: b,* anterior end of larva, ventral view; *d,* mouth hook; *g,* anterior respiratory structure. **c, e,** *D. dorsalis: c,* mouth hook; *e,* anterior respiratory structure.

feldi from other fruit fly larvae which we have examined is a black triangular or heart-shaped pigmented area (plate) situated in the muscles just beneath the skin, on the ventral surface behind the head, in line with the anterior respiratory organs (fig. 1, *b*). This appears to be a very important detail in separating this species, but it was overlooked until it was discovered by Miss Adachi while she was drawing the anterior portion of the larva.

Distributional List of Micronesian Tephritidae

	Micronesian Island Groups											
				Caroline								
	Bonin	N. Mariana	S. Mariana	Palau	Yap	Caroline Atolls	Truk	Ponape	Kusaie	Marshall	Gilbert	Other Localities
Dacinae												
1. Dacus (Gymnodacus) calophylli				×								Australia, Malaya
2. D. (Strumeta) cucurbitae			×									Orient, Australia, Pacific, Mauritius I., Africa
3. D. (S.) dorsalis			×									S. Asia, Indonesia, Philippines, Formosa, Ryukyu Is., Hawaii
4. D. (S.) sp.			×									
5. D. (S.) frauenfeldi			×	×	×	×	×	×	×	×		Stuarts I., Malaya, New Britain
6. D. (S.) ochrosiae			×									
7. D. (Zeugodacus) boninensis	×											
Trypetinae												
8. Cycasia oculata			×									
9. Euphranta (Staurella) lemniscata		×	×									Formosa
10. Hendelina bisecta			×									
11. H. parva						×						
12. Sphaeniscus sexmaculatus atilia												Orient, Pacific, Okinawa, Admiralty Is., Philippines, Japan
Tephritinae												
13. Stylia sororcula	×		×									Tropics, subtropics
14. Platensina platyptera			×									Formosa
15. Spathulina acroleuca	×	×	×	×	×	×	×	×	×	×		Africa, Asia, to Australia, New Caledonia, Philippines, Fiji
16. Tephritis formosella			×									Formosa
Schistopterinae												
17. Rhabdochaeta guamae			×									

D. curcurbitae infests chiefly vegetable crops, whereas *D. dorsalis* and *D. frauenfeldi* infest a wide range of fruits; the latter appears to have a preference for breadfruit (*Artocarpus*).

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Key to Micronesian Subfamilies, Genera, and Species

1. Wings with a deep cleft on margin, at apex of subcostal vein, wings predominantly brown with radiating streaks of brown extending to anterior and apical margins (fig. 15, *b*). Front with a strong pair of white interfrontal bristles (Schistopterinae) .... **Rhabdochaeta guamae**
   Not as above 2

2(1). Chaetotaxy reduced; lacking following bristles: ocellar, postvertical, presutural, dorsocentral, sternopleural, and humeral. Antennae slender, the third segment usually at least three times longer than wide; postocular cilia short, undeveloped. Cubital cell drawn out into a long, apical lobe, lobe extends over half way to wing margin (fig. 5, *b*) (Dacinae) 3
   Chaetotaxy more completely developed; some or all of the above bristles present; postocular cilia distinct. Third antennal segment about two times as long as wide. Cubital cell not long-attenuated at apex, lobe extends less than one-third to wing margin 9

3(2). Two scutellar bristles present. Lateral yellow vittae on mesonotum extending at least as far as inner supraalar bristles 4
   Four scutellar bristles present. Vittae on mesonotum abbreviated, extending only one-half distance from suture to hind margin (fig. 5, *a*) .... **Dacus (Zeugodacus) boninensis**

4(3). Wings with a transverse band extending over cross veins 5
   Wings with no transverse band 6

5(4). Wings with three broad bands (fig. 4, *e*). Notopleural calli brown. Yellow coloring of humeri extends as a continuous band over top edge of each mesopleuron (fig. 4, *c*). Face all yellow .... **Dacus (Strumeta) ochrosiae**
   Wings with one narrow band in addition to cubital streak (fig. 3, *d*). Humeri brown to black. Notopleural calli yellow. Top edge of mesopleuron not continuously yellow. Face with a pair of large black spots .... **Dacus (Strumeta) frauenfeldi**

6(4). Third tergum of male with a row of cilia on each side. Female with well-developed facial spots, as wide as antennal furrows 7
   Third tergum of male not ciliated. Female with facial spots small and narrow, not as wide as antennal furrows .... **Dacus (Gymnodacus) calophylli**

7(6). Only two yellow vittae present on mesonotum. Cross veins not fumose. Two pairs of inferior fronto-orbital bristles present. Mesonotum has black markings 8
   Three yellow vittae on mesonotum. Cross veins brown fumose. Three pairs of inferior fronto-orbital bristles present. No black markings on mesonotum .... **Dacus (Strumeta) cucurbitae**

8(7). Abdomen all black .... **Dacus (Strumeta)** n. sp.? rel. to **dorsalis**
   Abdomen largely rufous, with a black basal band across terga two to three and a narrow median black vitta extending longitudinally over terga three to five .... **Dacus (Strumeta) dorsalis**

9(2). Postocular bristles thickened and yellow white. Mesonotum thickly covered with recumbent, flattened, pale setae. Dorsocentral bristles situated near suture, or on a line with suture (except in *Platensina*). Two scutellar bristles are present (except in *Tephritis*) (Tephritinae)..................................10
Postocular bristles thin and slender, black except in *Cycasia* Malloch. Mesonotum without flattened pale setae. Dorsocentral bristles near a line drawn between anterior supraalar bristles. Four scutellar bristles present (Trypetinae)..................................13

10(9). Four scutellar bristles present. Wings as in figure 14, *a*, brown with numerous scattered hyaline spots over entire area..........**Tephritis formosella**
Two scutellar bristles. Wings not as above..................................11

11(10). Wings very broad, less than twice as long as wide, broadest point at m cross vein. Wing pattern as in figure 12, *a*......................**Platensina platyptera**
Wings nearly three times longer than wide, broadest at about middle of cell 1st M_2. Wing pattern not as above..................................12

12(11). Proboscis long, slender, and geniculate. Last section is equal in length to lower margin of head (fig. 11, *c*). Anterior portion of oral margin is produced so that head is longer at level of mouth than at antennae. Wings as in figure 11, *a*..................................**Stylia sororcula**
Proboscis rather stout, labellum much shorter than head. Oral margin not produced. Wings as in figure 13, *b*..................................**Spathulina acroleuca**

13(9). Cubital cell developed into at least a small wedge-shaped lobe on lower margin. Subcosta enters costa at a right angle. Wings as in figures 7, *b*; 8, *a*; 10, *a*. Postocular bristles black..................................14
Cubital cell without an apical lobe. Subcosta slopes gradually into costa, otitid-like. Wing markings as in figure 6, *b*. Postocular bristles pale...... .... **Cycasia oculata**

14(13). Pleuroterga (lateral divisions of metanotum) covered with fine, pale pile. Dorsocentral bristles placed well behind a line drawn between anterior supraalars. Scutellum yellow. Ovipositor base longer than remainder of abdomen. Wings as in figure 7, *b*................**Euphranta (Staurella) lemniscata**
Pleuroterga bare. Dorsocentrals placed opposite anterior supraalars. Scutellum black. Ovipositor short, *in situ,* the visible portion not longer than last two abdominal terga. Wings as in figures 8, *a*; 10, *a*....................15

15(14). Two pairs of inferior fronto-orbital bristles present. Thorax all black. Halteres yellow. Mesonotum covered with recumbent yellow hairs. Bases of wing hyaline, pattern as in figure 10, *a*; cubital cell with a small, wedge-shaped, apical lobe..................**Sphaeniscus sexmaculatus atilia**
Three pairs of inferior fronto-orbital bristles present. Humeri and propleura yellow. Knobs of halteres black. Wing bases marked with black, pattern as in figures 8, *a*; 9, *b*. Recumbent hairs on mesonotum black. Cubital cell attenuated at apex (fig. 9, *b*) (*Hendelina*)..................................16

16(15). Wings with an isolated semicircular band in apical third (fig. 9, *b*). Arista with very short sparse hairs (fig. 9, *a*)..................................**Hendelina parva**
Wings without such an isolated band, pattern as in figure 8, *a*. Arista short plumose (fig. 8, *b*)..................................**Hendelina bisecta**

SUBFAMILY DACINAE

Genus **Dacus** Fabricius

Dacus Fabricius, 1805, Syst. Antliatorum, 272.

This group has been split up into numerous "genera" by various authors, but we have come to the conclusion that the great majority should be treated as subgenera. This has been discussed in various of the senior author's publi-

cations on Dacinae and in a generic reclassification which is now in press. Representatives of only three subgenera are known to occur in Micronesia—one species of *Dacus* (*Gymnodacus*), five species of *Dacus* (*Strumeta*), and one of *Dacus* (*Zeugodacus*). The members of the *Dacus s. l.* can be recognized by the characters given in the above key.

Genotype: *Dacus armatus* Fabricius.

1. **Dacus (Gymnodacus) calophylli** (Perkins and May).

Asiadacus calophylli Perkins and May, 1949, Univ. Queensland, Dept. Biol. 2(14): 16-18, fig. 8.

Dacus (*Gymnodacus*) *calophylli* (Perkins and May) Hardy, 1951, Pacific Science **5**(2): 130, fig. 6, *a, b*.

This is the first record of this species in Micronesia. It has previously been known from Australia and Malaya only, and has been bred from *Calophyllum inophyllum*.

D. calophylli can be distinguished from other Micronesian Dacinae by the lack of cilia on each side of the third tergum in the males. Superficially, it most closely resembles *D.* (*Strumeta*) *dorsalis* Hendel. It differs from *D. dorsalis* in having small, inconspicuous facial spots, in having the pollinosity on the mesonotum arranged in a definite pattern (rather H-shaped), and in having the costal band broad, filling nearly all of cell R_3. The females have short ovipositors, slightly over 3 mm.; the ovipositor of *D. dorsalis* measures 4.5-4.7 mm.

DISTRIBUTION: Australia, Malaya, western Caroline Is.

PALAU IS. ANGAUR: Three, March-May 1954, on *Eugenia* sp., Beardsley.

2. **Dacus (Strumeta) cucurbitae** Coquillett (fig. 2).

Dacus cucurbitae Coquillett, 1899, Ent. News **10**: 129.

The melon fly was described from material collected in Hawaii, where it had been introduced from the Orient about 1895. It was first discovered in Guam on November 7, 1936 (Swezey, 1946, B. P. Bishop Mus., Bull. **189**: 199). It is distinguished from all other fruit flies of this region in having three postsutural yellow vittae on the mesonotum; in having both the r-m and m cross veins infuscated, as well as in the presence of three pairs of inferior fronto-orbital bristles; and in its pale coloration and in having the preapical setae of the ovipositor situated near the apex of the piercer (fig. 2).

DISTRIBUTION: Widespread throughout the Orient and much of the Pacific (including records from Darwin, Northern Territories, Australia); Mauritius; Kenya Colony, Africa; and southern Mariana Is.

S. MARIANA IS. SAIPAN: Nov. 1944 to June 1946, Hagen, Oakley. TINIAN: Mar. 1946, ex zucchini squash, Hadden; Nov. 1952, Beardsley.

GUAM: Various localities, May 1937 to Nov. 1952, reared from melon, Oakley, Maehler, Townes, Gressitt, Krauss.

This species was not represented in the early Japanese collections (1936-1940) made by Esaki and others.

HOSTS: This species has a very wide host range and is one of the most important pests of vegetable crops wherever it is found. It is a serious pest of a wide variety of cucurbitaceous plants and of tomatoes, peppers, and other vegetable crops. In Hawaii the melon fly has been recorded as attacking 36 different kinds of plants belonging in 12 families. The United States Department of Agriculture has listed 82 hosts of this species. On Guam it has been recorded from *Phaseolus vulgaris, Vigna sinensis, Ochrosia* sp.; *Cucumis sativus, C. melo* var. *cantalupensis,* and *Cucurbita pepo.*

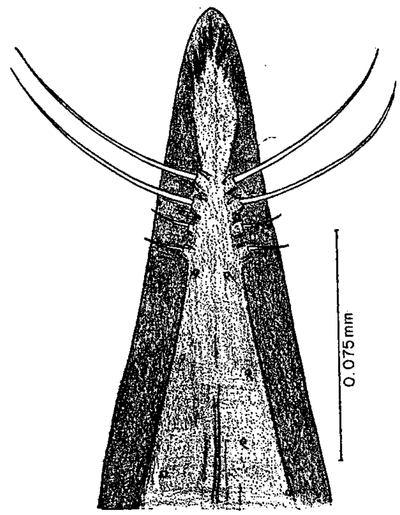


FIGURE 2.—*Dacus (Strumeta) cucurbitae,* apex of female ovipositor.

3. **Dacus (Strumeta) dorsalis** Hendel.

Dacus dorsalis Hendel, 1912, Suppl. Ent. **1**: 18.

Musca ferruginea Fabricius, 1794, Ent. Syst. **4**: 342. [Preoccupied by *Musca ferruginea* Scopoli, 1763, Ent. Carn., 340.]

Dacus conformis Doleschall, 1859, Nat. Tijd. Ned. Ind. **17**: 122. [Preoccupied by *Dacus conformis* Walker, 1857, Linn. Soc. London, Proc. **1**: 34.]

Dacus ferrugineus var. *mangiferae* Cotes, 1893, Indian Mus., Notes **3**(1): 17. [A name which has not been used in the literature and which is being disregarded under the provisions of the Copenhagen Decisions on Zoological Nomenclature "Recognition of the principle of conservation" (1953, p. 26). Refer to Hardy "Taxonomy and distribution of the oriental fruit fly and related species," in press.]

Chaetodacus ferrugineus var. *versicolor* Bezzi, 1916, Bull. Ent. Res. **7**: 105.
Chaetodacus ferrugineus var. *okinawanus* Shiraki, 1933, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **8**(2): 62.

There is a large complex of species related to *D. dorsalis* ranging throughout the Orient and Pacific. One species in the Micronesian collection shows relationship to *D. dorsalis* but differs in having the abdomen completely black. Both species can be differentiated from all other Micronesian *Strumeta* in that they have only a costal band and cubital streak developed in the wing; no other fumose markings are present. They have two broad yellow postsutural vittae on the mesonotum, the dorsum of the thorax is marked with black, and the face has a pair of large black spots. In *D. dorsalis* the abdomen is chiefly rufous. Terga two and three have black basal bands and a narrow longitudinal black vitta extending down the median portion of terga three to five. The ovipositor characters are most useful in distinguishing *D. dorsalis* from related species. For more complete descriptive details and figures refer to Hardy "Taxonomy and distribution of the oriental fruit fly and related species," in press.

DISTRIBUTION: Widespread through India, Burma, Ceylon, Thailand, Indo-China, Indonesia, Philippine Is., Formosa, Ryukyu Is., South China, Micronesia, and Hawaiian Is. The fly was introduced into the Hawaiian Islands, probably late in 1944, from Saipan, where it had evidently been for some time. Monzen [1938, Oyo Dobutsu.-zasshi **10**(3-4): 143-145] recorded that it was evidently introduced from Saipan to the Bonin Islands in 1932.

S. MARIANA IS. SAIPAN: Nov.-Dec. 1944 to Aug. 1951, ex *Artocarpus atilis, Annona muricata,* and mango, Dybas, Maehler, Oakley, and Bohart. TINIAN: Marpo Valley, June 1946, ex *Artocarpus atilis* and mango, Oakley; Mt. Lasso, June 1946, ex *Terminalia catappa,* Oakley. ROTA: Son Son and Ongiano, June 1946, ex mango and from sweeping breadfruit leaves, Oakley. GUAM: Numerous localities, Dec. 1947 to Aug. 1952, ex papaya and *Annona reticulata,* Bohart, Maehler, and Krauss.

HOSTS: The Oriental fruit fly has a very wide host range and apparently attacks almost all types of fruits. In Hawaii alone it has been recorded from more than 125 different hosts. Throughout its range it probably has been taken from more than 250 different hosts.

4. Dacus (Strumeta) n. sp.? rel. to **dorsalis.**

One female specimen is on hand from Saipan, Marianas, from hills east of Garapan, January 1945 (H. S. Dybas), which appears to be an undescribed species related to *D. dorsalis*. It is similar to *D. dorsalis* in most respects, differing chiefly in having the abdomen all black. The ovipositor characters probably will be distinctive, but these have not been studied. The specimen will be described when more material is available.

5. Dacus (Strumeta) frauenfeldi Schiner (fig. 3, *a-d*).

Dacus frauenfeldi Schiner, 1868, Reise Novara, Diptera, 262.

Dacus albistrigatus de Meijere, 1911, Tijdschr. Ent. **54**: 377.

This species is very distinctive and can be separated from all known *Strumeta* by the single narrow transverse band which extends through the middle portion of the wing, by the very oblique r-m cross vein, and by the lack of a distinct costal band (fig. 3, *d*). The humeri are brown to black, and the yellow mark on each mesopleuron is wedge-shaped. The mesonotum is black with

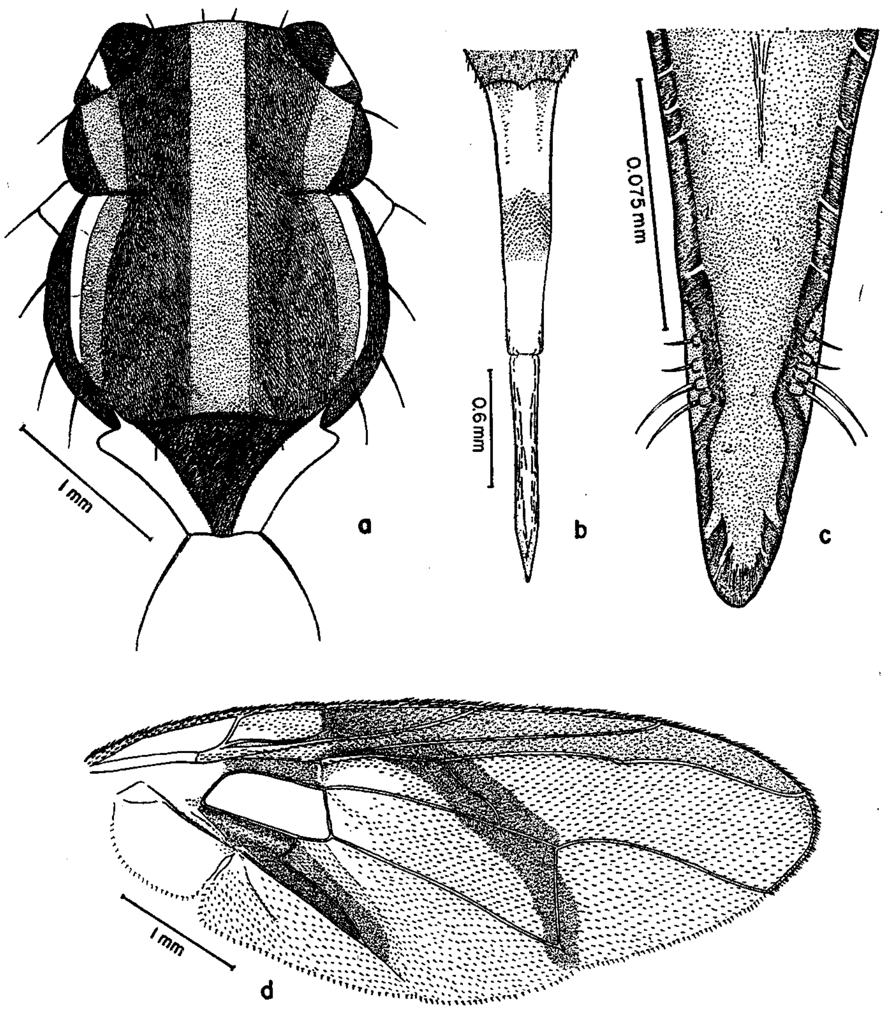


FIGURE 3.—*Dacus (Strumeta) frauenfeldi:* **a,** thorax, dorsal view; **b,** extended ovipositor; **c,** apex of piercer; **d,** wing.

rather narrow postsutural yellow vittae, extending to about the inner supraalar bristles. A broad gray pollinose stripe extends down the median portion of the mesonotum. The scutellum is yellow with a black basal and dorsal spot of variable size (fig. 3, *a*). The first two costal cells are yellow-brown fumose; the second is completely filled with microtrichia. The wing markings are as in figure 3, *d*. The visible portion of the ovipositor, *in situ,* is about equal in length to the fifth abdominal tergum. The extended ovipositor (fig. 3, *b*) measures about 3.7 mm. The rasper is short and poorly developed, and the piercer is moderately sharp-pointed with two long and two short preapical setae (fig. 3, *c*). Length: body, 6-7 mm.; wings, 5.5-6 mm.

DISTRIBUTION: The species was first described from Stuarts I. It has been recorded from Malaya, New Britain, and Caroline and Marshall Is.

S. MARIANA IS. SAIPAN: Near Aftena Pt., June 1946, Townes.

PALAU. BABELTHUAP: Eimilik-Ngarumisukan, Aug. 1939, Esaki. KOROR: 1939, Yoshino; May-Nov. 1953, some at light, others on *Ipomoea* flowers, Beardsley; Palao, 1933, taken in Plant Quarantine, Yokohama.

YAP. YAP: July 1946, ex mango, Oakley.

CAROLINE ATOLLS. PULO ANNA: Sept. 1952, ex *Eugenia,* Krauss. FAIS: Oct. 1952, Krauss. SOROL: Sorol I., Oct. 1952, Krauss. WOLEAI: Utegal, July 1946, ex *Eugenia,* Oakley. FARAULEP: Faraulep I., Sept. 1952, Krauss. IFALIK: Ifalik I., Aug. 1953, at light, Bates. SATAWAL: Sept. 1952, Krauss. LOSAP: Losap I., Oct. 1952, Beardsley. SATAWAN: Nov. 1952, Beardsley. KAPINGAMARANGI: Hare I., Aug. 1946, Townes. MOKIL: July 1948, on *Cyrtosperma* leaves, Owen. PINGELAP: July 1949, Owen.

TRUK. TONOAS (Dublon) and WENA (Moen): July 1946 to Feb. 1948, Oakley, Maehler.

PONAPE. Colonia, June 1933, Uchiyama, Jan. 1938, Esaki, Feb.-Mar. 1948, Oakley, Maehler; Trop. Indust. Inst., May 1939.

KUSAIE. Lelo, Dec. 1936, Esaki; Lele I., Aug. 1946, Oakley; Mutunlik, Apr. 1953, Clarke.

MARSHALL IS. BIKINI: July-Aug. 1947, Cole. WOTHO: Oct. 1953, Beardsley. KWAJALEIN: Apr. 1948, Maehler. LIKIEP: Likiep I., Aug. 1946, Townes. LIB: Oct. 1953, Beardsley. NAMU: Kaginen I., Oct. 1953, resting on breadfruit, Beardsley. AILINGLAPALAP: Near Airek, Aug. 1946, Oakley. MAJURO: Uliga I., Nov. 1953, on breadfruit, Beardsley. ARNO: Ine I., June 1950, *Wedelia,* La Rivers, Oct. 1952, ex breadfruit, Hatheway. JALUIT: Emidj I., Sept. 1953, resting on breadfruit, Beardsley; Medyado I., Aug. 1946, Townes. KILI: Oct. 1953, on breadfruit, Beardsley.

HOSTS: Recorded from *Psidium guajava,* mango, breadfruit, and *Eugenia.*

6. Dacus (Strumeta) ochrosiae Malloch (fig. 4, *a-f*).

Dacus ochrosiae Malloch, 1942, B. P. Bishop Mus., Bull. **172**: 201-202.

This species is distinguished from all other *Dacus* (*Strumeta*) by the wing pattern, as shown in figure 4, *e*. The wing bands are rather similar to those of *Dacus umbrosus* Fabricius, but the species show no particular relationships in other details. *D. ochrosiae* is further characterized by its all yellow face (fig. 4, *d*), by its black notopleural calli, by the yellow upper margin of the mesopleura (fig. 4, *c*), by the broad gray pollinose stripe from the middle of the mesonotum, and by the large black spot covering the disc of the scutellum (fig. 4, *a*). The ovipositor has not previously been described. *In situ,* the basal segment is about equal in length to the fifth abdominal tergum. The ovipositor is short and broad (fig. 4, *b*); when extended it measures about 3.8 mm. The basal segment is as broad as long, measuring approximately 1.13 mm. long

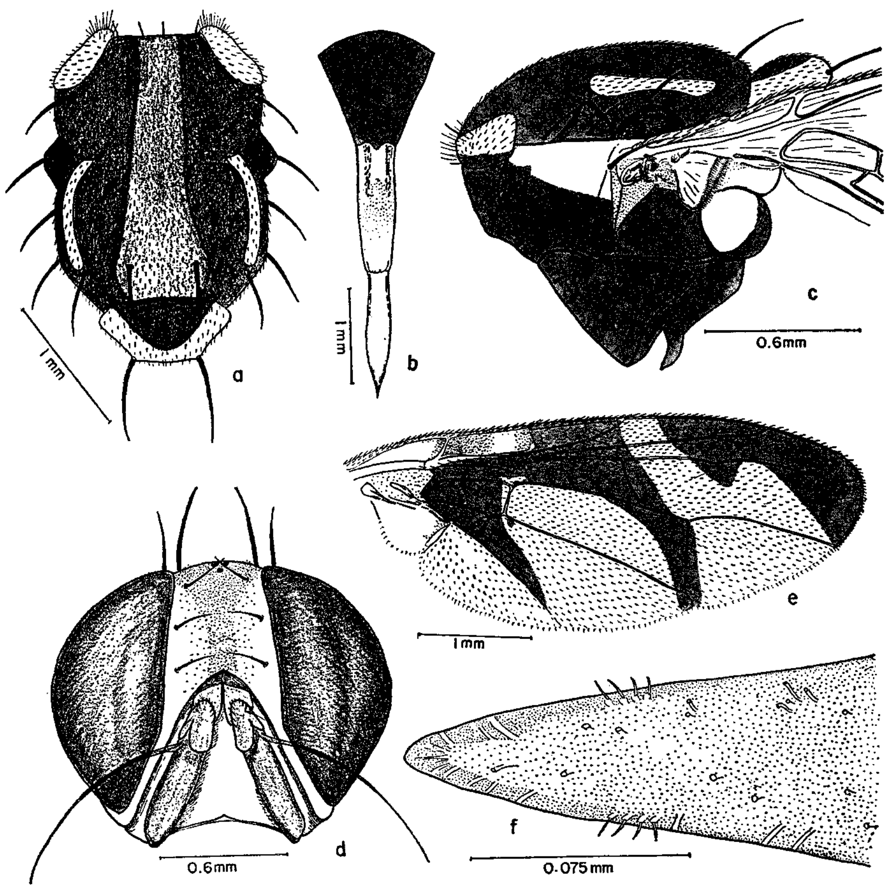


FIGURE 4.—*Dacus* (*Strumeta*) *ochrosiae:* **a,** thorax, dorsal view; **b,** ovipositor, full length; **c,** thorax, lateral view; **d,** head, front view; **e,** wing; **f,** apex of piercer.

and about the same across the anterior margin. The spiracles are situated about 0.28 mm. from the anterior lateral margins of the segment. The inversion membrane is about 1.44 mm. long by 0.38 mm. at its widest point. The rasper extends to within 0.34 mm. of the base of the segment. The piercer is 1.25 mm. by 0.27 mm. at its widest point. The oviduct opens about 0.3 mm. from the apex of the piercer and four tiny, inconspicuous, preapical setae are present about 0.07 mm. from the tip (fig. 4, *f*). Length: 6-8 mm.

DISTRIBUTION: Southern Mariana Is.

S. MARIANA IS. SAIPAN: Mt. Pogagehow, July 1949, ex *Aglaia mariannensis*, Ross; Mar.-Sept. 1944, Hagen; Garapan, May 1940, Yasumatsu and Yoshimura; Trop. Indust. Inst. Branch Sta., May 1939; July 1933, Esaki's collection. TINIAN: Mt. Lasso, June 1946, Oakley; Lake Hagoya, June 1946, Oakley. AGIGUAN: June 1952, Owen. GUAM: Several localities, July 1939-May 1948, ex *Aglaia mariannensis, Ochrosia* sp., and *Ximenia americana*, Oakley and Maehler.

HOSTS: Fruits of *Ochrosia* sp., *Ximenia americana, Aglaia mariannensis, Malpighia glabra, Eugenia* sp., *E. jambos*, and *Terminalia catappa*.

7. Dacus (Zeugodacus) boninensis Hardy and Adachi, n. sp. (fig. 5, *a-d*).

Male. Head: Front is almost two times longer than wide and has two pairs of inferior fronto-orbital bristles and two pairs of superior fronto-orbitals. Front is chiefly rufous, with a slight discoloration of brown in the median portion and indistinct brownish spots at the bases of the bristles. Face has a moderately large oval black spot on each side in antennal groove. Third antennal segment is brown to black and is about equal in length to face. *Thorax:* Predominantly black, the humeri and notopleural calli yellow. A short, postsutural, yellow stripe is present on each side of mesonotum. This extends about half the distance from suture to hind portion of mesonotum. Scutellum is yellow on sides and has a broad median black vitta extending over the segments (fig. 5, *a*). *Wings:* Almost entirely hyaline; only stigma (third costal section) and apical portion of costal margin are distinctly fumose. Costal band is almost completely interrupted at apex of cell R_2 (the fourth costal section). Band is slightly developed through apical portion of cell R_3 (along wing margin) and into upper apical portion of cell R_5 (fig. 5, *b*). First two costal cells are hyaline and have no microtrichia on membrane. Third costal section (stigma) is longer than second and is equal in length to fourth. The r-m cross vein is oblique and very slightly curved and is situated at apical two-thirds of cell 1st M_2. Cubital streak is completely lacking, except for a small amount of yellow in basal portion of cell. Attenuated portion of cubital cell extends about two-thirds distance to wing margin. *Abdomen:* Chiefly dark red, tinged with brown. Terga two, three, and four have a moderately broad band of black extending along anterior margins. Terga four and five have an abbreviated black vitta extending part way down median portion, not over one-half length of segment. Fifth tergum is almost completely rufous, including shining areas. *Legs:* Almost entirely rufous. Hind femora are brownish at extreme tips. Hind tibiae are almost completely brown, as are the last three to four tarsal subsegments. Middle and front tibiae are slightly tinged with brown especially at their bases.

Female: Like male except for secondary sexual characters. Attenuated portion of cubital cell extends about half distance to wing margin. Costal band is slightly more developed in female. Apical portion of cell R_2 is very lightly fumose along wing margin. Abdomen is also more extensively blackened in specimen at hand. *Ovipositor: In situ*, as seen from above, visible portion is about equal in length to fifth abdominal tergum. When fully extended (fig. 5, *c*) ovipositor measures slightly more than 4 mm. Piercer is rather gradually tapered to apex, measuring about 1.4 mm. long by 0.2 mm. at its widest point. Open-

ing of oviduct is situated about 0.3 mm. from apex, and three pairs of tiny preapical setae are present (fig. 5, *d*). Inversion membrane measures approximately 1.43 mm. long by 0.34 mm. at its widest point. Rasper extends to within 0.27 mm. of base of segment. Basal segment is 1.35 mm. long by 1.28 mm. wide, measured across anterior margin. Spiracles are located about 0.4 mm. from anterior lateral margins of basal segment.

Length: body, 7 mm.; wings, 6 mm.

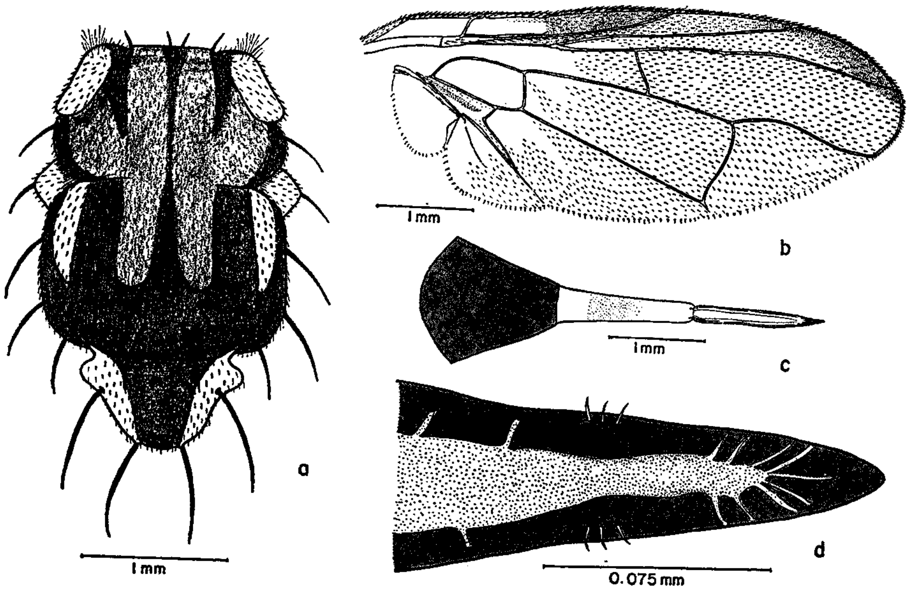


FIGURE 5.—*Dacus* (*Zeugodacus*) *boninensis:* **a**, thorax, dorsal view; **b**, wing; **c**, ovipositor, full length; **d**, apex of piercer.

Holotype male (US), Chichi Jima, Bonin Is., July 10, 1951, R. M. Bohart; allotype female (US), Haha Jima, Bonin Is., July 18, 1951, R. M. Bohart. Three paratype males (BISHOP, UH), one same locality as type, June-July 1949, D. B. Langford and one, same data as for allotype.

DISTRIBUTION: Bonin Is.

HOST: Unknown.

This species fits in the group of *Zeugodacus,* which has but two yellow vittae on the mesonotum, no cross bands on the wings, a pair of black spots on the face, and a longitudinal black stripe extending over the scutellum. It fits nearest to *Dacus* (*Zeugodacus*) *pendleburyi* (Perkins) from Malaya but differs as follows: The scutellum has a broad longitudinal band of black over the dorsal surface, not with a basal black band as in *pendleburyi.* The femora and the front and middle tibiae are chiefly or entirely yellow to rufous and only the hind femora are brown to black tipped. In *pendleburyi* the legs are dark brown, almost black, with only the basal two-thirds of the femora fulvous. Perkins [1938, Roy. Soc. Queensland, Proc. **49**(11): 142] says the stigma of *pendle-*

buryi is nearly two times longer than the second costal cell "the proportions . . . being 32: 18." In *boninensis* the proportion is 30: 25. The stigma is just slightly longer than the second costal section. This species is similar in some respects to *Dacus* (*Zeugodacus*) *bipustulatus* (Bezzi), but it is distinguished by a distinct costal band, by a supernumerary lobe in the wing of the male, and by the face, which is not all black.

Subfamily TRYPETINAE

Genus **Cycasia** Malloch

Cycasia Malloch, 1942, B. P. Bishop Mus., Bull. **172**: 202-203.

Malloch says that this genus undoubtedly belongs to the tribe Euribini as treated by Hendel (1927, IN Lindner, Die Fliegen der Palaearktischen Region, Trypetidae, **49**: 17). It is the only representative of this group which is known to occur in Micronesia, and it is readily distinguished from other fruit flies by its lack of an apical lower lobe on the cubital cell and by the wing markings (fig. 6, *b*). Malloch's figure of the wing shows the subcostal vein entering the costa at a gentle curve rather than turning up at a right angle. This is an error; we have studied a paratype, and the subcostal vein is normal (fig. 6, *b*).

Genotype: *Cycasia oculata* Malloch.

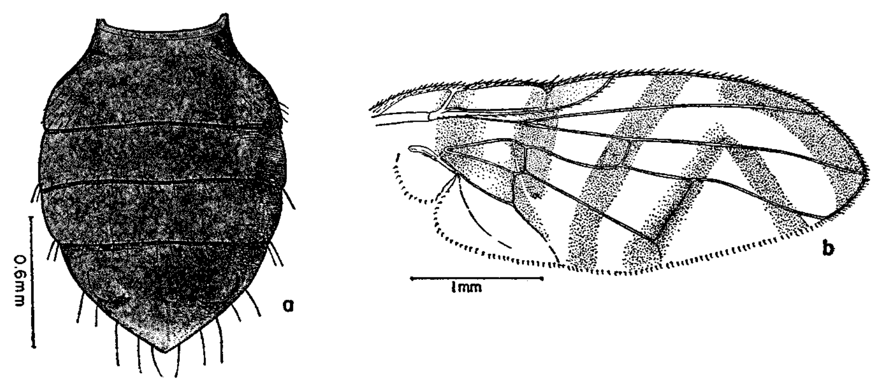


FIGURE 6.—*Cycasia oculata:* **a**, abdomen; **b**, wing.

8. Cycasia oculata Malloch (fig. 6, *a, b*).

Cycasia oculata Malloch, 1942, B. P. Bishop Mus., Bull. **172**: 203.

This is a fulvous or orange-yellow species with a glossy abdomen and thorax. It is distinguished by its wing characters (fig. 6, *b*). Malloch's description is adequate.

Length: 4 mm.

Female unknown.

DISTRIBUTION: The species was described from Mount Chachao, Guam. It has also been recorded from Piti, Agat, and Asan, Guam. This spe-

cies has not been taken since the type series, but a paratype was loaned to us by the U. S. National Museum.

HOST: *Cycas* sp.?

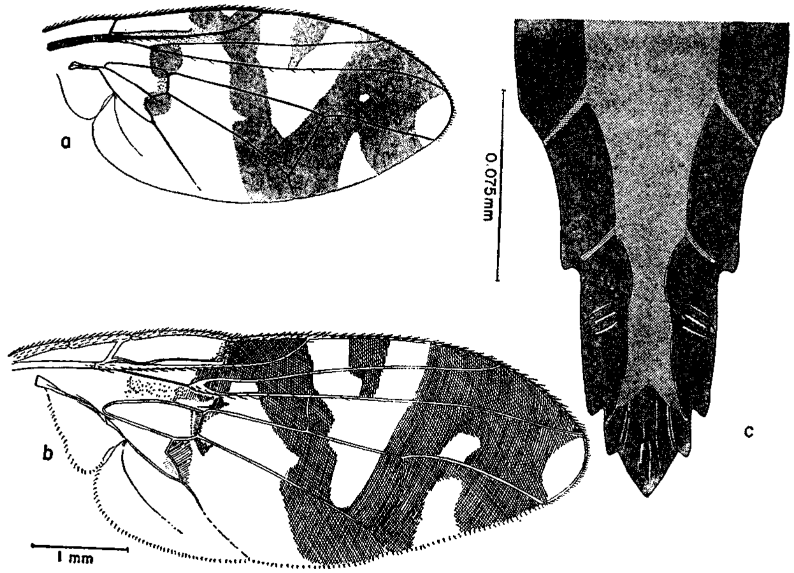


FIGURE 7.—*Euphranta (Staurella) lemniscata:* **a**, wing (after Enderlein); **b**, wing (Saipan specimen); **c**, apex of piercer.

9. Euphranta (Staurella) lemniscata (Enderlein). (Figure 7, *a-c*.)

Trypeta lemniscata Enderlein, 1911, Zool. Jahrb., Abt. Syst. **31**(3):426-427, fig. g.

Euphranta (Staurella) lemniscata (Enderlein) Hardy, 1955, Pacific Science **9**(1):82.

Specimens at hand from the Marianas appear to belong to this species, but they are slightly atypical. In body coloration and in most details they seem to agree with the original description. The wings, however, differ from that of the type (as drawn by Enderlein) in lacking a hyaline spot in the middle of the third costal section (stigma) and in having the hyaline mark on the apical hind margin of the wing extending uninterrupted, in most cases, from the margin into the middle of cell R_5 (fig. 7, *b*), instead of extending as a wedge-shaped mark to just below vein M_1+_2, and with a small isolated spot in the middle of cell R_5 (fig. 7, *a*). These details appear variable. Some specimens on hand have this mark interrupted slightly, but none has such a small isolated hyaline mark as is depicted by Enderlein's drawing. It is probable that *E. rivulosa* Bezzi [1928, Diptera Brachycera and Athericera of the Fiji Islands, British Mus. (Nat. Hist.), 109], from Fiji, should be considered a synonym of *lemniscata*. Bezzi indicates that *rivulosa* differs in the abdominal pattern and

in minor details of the wing pattern. A specimen on hand from Fiji shows enough variation in the wing pattern from Bezzi's figure to fit our concept of *lemniscata,* except for the lack of a hyaline spot in the third costal section, as in the specimens from the Marianas. We cannot see distinctive differences in the abdominal pattern. Bezzi says the abdomen is yellowish with thin whitish dust and with an abbreviated band on the front margin of segments two to four and with a rounded black spot on each side of the fifth tergum. The black pattern is somewhat more extensive in the specimens from the Marianas than in Enderlein's type, but this difference could well be varietal. We see no significant difference in the pattern itself. The ovipositor of *rivulosa* has not been studied; if it is a distinct species, differences should be found here. The ovipositor of *lemniscata* has not previously been described. The visible portion, *in situ,* is elongate and tubular. It is longer than the remainder of the abdomen. When fully extended, the ovipositor is very elongate; it measures approximately 9.25 mm. The basal segment is 3.5 mm. by 1.4 mm. at its widest point. The spiracles are situated about 0.7 mm. from the anterior lateral margins of the segment. The inversion membrane is 3.5 mm. by 0.46 mm. at its widest point. The teeth of the rasper extend over most of the inversion membrane, but these are stronger and more dense in the median portion of the segment. The piercer is about 2.5 mm. long by about 0.2 mm. at its widest point. The oviduct opens about 0.3 mm. from the apex. The piercer is distinctively spear-head-shaped with four pairs of small preapical lobes (fig. 7, *c*) and two pairs of very tiny inconspicuous preapical setae present between the second and third pairs of lobes.

DISTRIBUTION: Previously known only from Formosa. Southern and northern Mariana Is.

N. MARIANA IS. PAGAN: Laguna, April 1940, Yasumatsu and Yoshimura.

S. MARIANA IS. SAIPAN: Trop. Indust. Inst. Branch Sta., May 1939, ex *Carica papaya;* Matansha-Calabera, May 1940, Yasumatsu and Yoshimura; Kobler Field, Jan. 1949, Maehler, Aug. 1951, R. M. Bohart. TINIAN: Northwest slope of Mt. Lasso, Mar. 1945, Dybas; ridge southeast section, Mar. 1945, Dybas.

HOST: Papaya.

Genus **Hendelina** Hardy

Hendelina Hardy, 1951, Pacific Science **5**(2): 179.

Pseudopheniscus Hendel, 1913, Suppl. Ent. 2: 82. [Emended to *Pseudospheniscus* Hendel, 1914, Wiener Ent. Zeitung **33**: 82. Preoccupied by *Pseudospheniscus* Ameghino, 1906.]

In the literature is a serious confusion of concepts regarding the proper generic name to use for these flies. It is obvious that the concepts for the entire group of related genera need to be completely revised in order to clarify the

confusion. *Hendelina, Neonomoea, Acidiella, Prospheniscus,* and others, possibly including *Phagocarpus,* may have to be considered under the concept of *Euleia* Walker, as outright synonyms or as subgenera.

10. **Hendelina bisecta** Hardy and Adachi, n. sp. (fig. 8, *a-d*).

Male. Head: Entirely yellow, except for compound eyes. Front measured from lower ocellus to lunule is about one and one-half times longer than wide and bears three pairs of strong inferior fronto-orbital bristles and two pairs of superior fronto-orbitals; upper pair is comparatively weak, it is less than half the size of lower pair (fig. 8, *b*). Front has numerous short, black hairs along eye margins, and median portion is sparsely covered with irregularly placed short hairs. Antennae are all yellow, the third segment about two times longer than wide and rounded at apex. Arista is short plumose. Occiput is rather flat, not noticeably puffed on lower portion, and genae are narrow (fig. 8, *b*). *Thorax:* Mesonotum is polished black in ground color. Anterior portion and sides are rather faintly grayish pollinose. This pollinosity extends down median portion as two broad gray vittae reaching about two-thirds length of mesonotum. Dorsocentral bristles are approximately on a line drawn between anterior supraalar bristles. Humeri are yellow to rufous. Area of mesonotum along each humerus, and including outer scapular bristle, is reddish. Inner scapular bristles are situated in a pair of small red spots. Pleura are almost entirely yellow

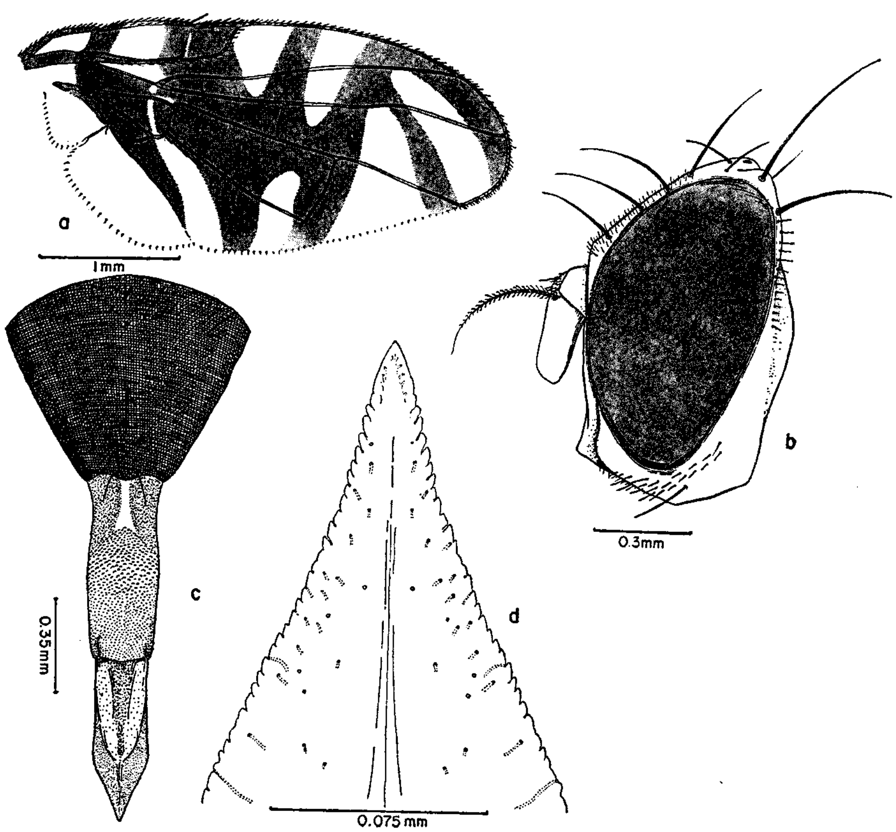


FIGURE 8.—*Hendelina bisecta:* **a,** wing; **b,** head, lateral view; **c,** ovipositor, full length; **d,** apex of piercer.

to rufous; only upper edge of mesopleura and hypopleura are discolored with brown. Scutellum is subshining black with slight discolorations of yellow brown on sides. Scutellum has four strong marginal bristles. Outer pair is approximately one and one-third times stronger than inner. Halteres have yellow-red stems and black knobs. *Legs:* Almost entirely yellow to rufous, only hind tibiae discolored with brown. Posteroventral surface of each front femur has a row of six or more strong bristles. These are approximately one and one-half times longer than width of femur. Posterodorsal surface of front femur has numerous short black bristles extending entire length and arranged in about three irregular rows. *Wings:* As in figure 8, *a*. Pattern is consistent in nine specimens at hand. First costal cell is entirely hyaline; second is brown fumose at its base and at its apex with a hyaline spot occupying median portion. Vein R_{1+2} curves up sharply entering costa at a right angle. Third section of costa is very short, less than half as long as second costal section. Vein R_3 is slightly undulated. The r-m cross vein is situated near apical two-thirds of cell 1st M_2, and m cross vein is transverse in position. Attenuated portion of cubital cell extends slightly over one-fourth distance to wing margin. *Abdomen:* Entirely polished black, rather thickly covered with short recumbent black hairs and with rather long bristles along posterior margin on each segment. These are stronger on fifth tergum. Some bristles are equal in length to body segment.

Length: body and wings, approximately 4 mm.

Female. Fits description of male in most details. Pleura, however, are almost entirely black, only the propleura yellow. Hind coxae, trochanters, and femora are also black. *Ovipositor: In situ,* visible portion is just slightly longer than fifth abdominal segment. Ovipositor is very short and stubby; when fully extended (fig. 8, *c*), it measures slightly less than 2 mm. Base is wider than long, it is approximately 0.75 mm. long by 0.9 mm. measured across anterior margin. Spiracles are situated approximately 0.2 mm. from anterior lateral margins of segment. Inversion membrane measures approximately 0.66 mm. by 0.25 mm. at its widest point, and rasper extends to within about 0.18 mm. of base of segment. Piercer is parallel-sided on basal three-fifths and is sharply tapered on apical portion; sides of apex are serrate (fig. 8, *d*) and no preapical setae are present. Piercer measures approximately 0.55 mm. in length by 0.2 mm. at its widest point. Oviduct opens about 0.2 mm. from apex of segment.

Holotype male (US) and allotype female (US), Guam: Pt. Ritidian, Oct. 1952, Krauss; seven paratypes, two males and five females (BISHOP, UH, US) same data as for type and from Saipan, Trop. Indust. Inst. Branch Sta., May 1939, ex *Carica papaya.*

DISTRIBUTION: Southern Mariana Is.

HOST: Papaya.

This species appears to be more closely related to *H. incerta* (Chen) than to any other known species. Like *H. incerta,* it has the oblique brown streak just behind the apex of the wing connected with the preapical transverse band (fig. 8, *a*). It differs, however, in having two wedge-shaped hyaline marks extending into the brown pattern from about the middle of the anterior margin of the wing and in having the preapical transverse band connected with the dark middle portion of the wing by a brown band extending along vein M_1+_2 (fig. 8, *a*). The species is also smaller than *H. incerta;* the body and wings are approximately 4 mm. long, rather than 6.5 mm. and 8 mm. respectively.

11. Hendelina parva Hardy and Adachi, n. sp. (fig. 9, *a, b*).

Head: Fits the description of *H. bisecta* except that front is two times longer than wide, third antennal segment is brown and not so broadly rounded at apex, and arista is

very sparsely haired (fig. 9, *a*). *Thorax:* Mesonotum and scutellum subshining black in ground color, rather thickly gray pollinose, with no distinct vittae present. Dorsocentral bristles are situated on a line drawn between anterior supraalars. Humeri and propleura are yellow, pleura are otherwise brown to black, hind portion tinged with red. Knobs of halteres are black. Scutellum has four marginal bristles. Outer pair is approximately two times stronger than inner. *Legs:* Middle and hind coxae, trochanters, and femora black, legs otherwise chiefly yellow. Front femora each with a row of strong bristles on posteroventral surface and with shorter scattered bristles irregularly placed along posterodorsal surface. *Wings:* Patterned much as in *H. alboscutellata.* One of the few notable differences is that upper portion of second costal section is fumose (fig. 9, *b*). *Abdomen:* Entirely shining black.

Length: body, 3 mm.; wings, 3.3 mm.

Female: Unknown.

Holotype, male (US), Merir I., southwest Caroline Is., Sept. 11, 1952, N. L. H. Krauss.

DISTRIBUTION: Western Caroline Is.

This species is very close to *H. alboscutellata* (Wulp). The resemblance is very striking except for a great difference in size. *H. parva* differs in that the scutellum is black, not yellowish; the halteres are black, not yellow white; and the head is differently shaped. The lower portion of the occiput is about one-third as wide as the eye, and the genae are narrow, about one-sixth as wide as the eye height. In *H. alboscutellata* the lower portion of the occiput is almost as wide as the eye and the genae are about one-third as wide as the eye height.

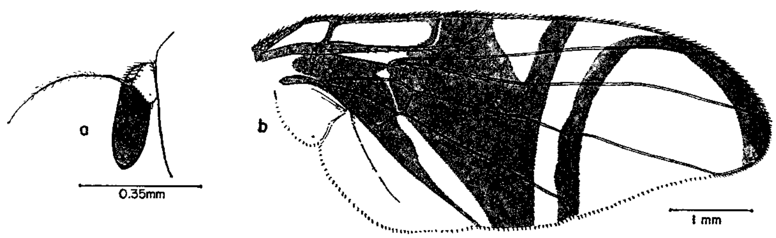


FIGURE 9.—*Hendelina parva:* **a**, antenna; **b**, wing.

Genus **Sphaeniscus** Becker

Sphaeniscus Becker, 1908, Berlin Zool. Mus., Mitt. **4**: 138.

Spheniscomyia Bezzi, 1913, Indian Mus. (Calcutta), Mem. **3**: 146 [invalid emendation of *Sphaeniscus* Becker].

This genus has not been recorded from Micronesia, but one species should probably occur in this region. *Sphaeniscus* differ from other Trypetinae which have the arista pubescent and the scutellum with four marginal bristles, in having the wings predominantly dark brown except at the base, with hyaline indentations along the front and hind margins (fig. 10, *a*).

Genotype: *Sphaeniscus quadrincisus* (Wiedemann).

12. **Sphaeniscus sexmaculatus atilia** (Walker). (Figure 10, *a, b.*)

Trypeta atilia Walker, 1849, List Dipt. Ins. Brit. Mus. **4**: 1021.

Trypeta melaleuca Walker, 1864, Linn. Soc. London, Proc. **7**: 238.

Trypeta sexincisa Thomson, 1868, K. Sven. Freg. Eugenies Resa, Zool., 579.

Trypeta formosana Enderlein, 1911, Zool. Jahrb., Abt. Syst. **31**(3) : 427.

Spheniscomyia sexmaculata Bezzi (*nec* Macquart), 1913, Indian Mus. (Calcutta), Mem. **3**: 148.

Spheniscomyia sexmaculatus Shiraki, 1933, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. **8**(2) : 354.

Spheniscomyia sexmaculata Malloch, 1939, Linn. Soc. New South Wales, Proc. **64**(3-4) : 450.

Sphaeniscus sexmaculatus atilia (Walker) Hardy, 1955, Pacific Science **9** (1) : 78.

This is the Oriental and Pacific subspecies of *S. sexmaculatus*. It differs from the typical (African) form in having the hind tibiae yellow and in that the pollinosity of the mesonotum is not arranged in a definite pattern. The species is easily recognized by the one wedge-shaped hyaline mark at the middle of the anterior margin of the wing, by the four hyaline indentations on the hind margin, and by the lack of hyaline spots in the middle of the wing (fig. 10, *a*).

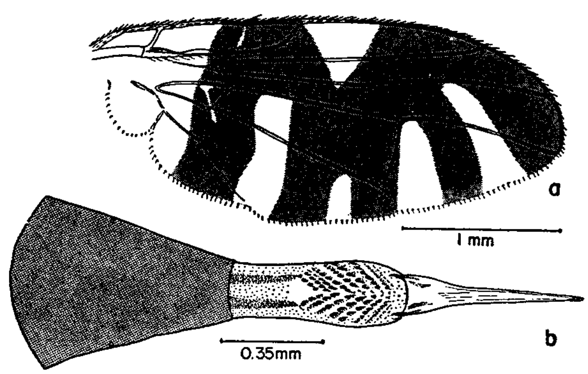


FIGURE 10.—*Sphaeniscus sexmaculatus atilia:* **a**, wing; **b**, ovipositor, full length.

The ovipositor characters have not been described. *In situ,* the basal portion is slightly longer than the last two abdominal terga. The extended ovipositor measures slightly less than 2 mm. The basal segment is about 0.75 mm. long by 0.52 mm. measured across its base. The spiracles are situated 0.2 mm. from the anterior lateral margins of the segment. The inversion membrane measures about 0.6 mm. long by 0.24 mm. at its widest point. The rasper is made up of thick, characteristically shaped teeth which extend to within 0.22 mm. of the base of the segment. The piercer is peculiarly shaped, is thick at the base, and

is long attenuated at the apex (fig. 10, *b*). The piercer is 0.63 mm. long by 0.12 mm. wide measured across its base. The oviduct opens about 0.13 mm. from the apex. There appear to be two pairs of tiny preapical setae present. Length: body and wings, 3-4 mm.

DISTRIBUTION: This subspecies is widespread through the Orient and Pacific. It is not known from Micronesia, though it very probably is present. It has been recorded from adjoining regions: the Admiralty Is., Okinawa, the Philippines, and Japan.

HOSTS: These flies infest the flower heads of various species of Labiatae and Compositae.

Subfamily TEPHRITINAE

Genus **Stylia** Robineau-Desvoidy

Stylia Robineau-Desvoidy, 1830, Mém. Prés. Acad. Roy. Soc. Paris **2**: 754.

Paroxyna Hendel, 1927, IN Lindner, Die Fliegen der Palaearktischen Region, Trypetidae, **49**: 146.

This synonymy was brought to my attention by Dr. E. M. Hering, in Berlin. He pointed out that *Trypeta tessellata* Loew (1844), genotype of *Paroxyna*, is congeneric with *Stylia bidentis* Robineau-Desvoidy (op. cit.) (= *elongatula* Loew, 1844), genotype of *Stylia*. Hering says that Hendel (op. cit., p. 50) was in error in considering *Stylia* as a synonym of *Myopites* Brébisson (1827). Not one of the three *Stylia* species described by Robineau-Desvoidy is a *Myopites;* all of these fit the generic concepts of *Paroxyna* Hendel.

This is a large genus, widespread throughout the Palaearctic, Nearctic, Neotropical, and Pacific regions. It is distinguished from other Tephritinae by having the lower margin of the head longer than that portion opposite the bases of the antennae; the proboscis slender and geniculate, the apical section as long as the lower margin of the head (fig. 11, *c*), and the wings rather irregularly spotted. Just one species has been found in Micronesia.

Genotype: *Stylia tessellata* (Loew).

13. Stylia sororcula (Wiedemann). (Figure 11, *a-c*.)

Trypeta sororcula Wiedemann, 1830, Aussereur. Zweifl. Ins. **2**: 509.

This is a small species characterized by having but two scutellar bristles; having the head much longer than high (fig. 11, *c*); having the upper superior fronto-orbital bristles yellow and the lower superior fronto-orbitals black, and by wing markings (fig. 11, *a*). The ovipositor characters have not been described. *In situ,* the basal segment is about equal in length to the last three abdominal terga. The ovipositor is very short; when fully extended, it measures approximately 2 mm. The basal segment measures about 0.82 mm. by 0.46 mm. across the anterior margin. The spiracles are situated about 0.25 mm. from the anterior lateral margins. The inversion membrane is about 0.55 mm. long by

0.15 mm. at its widest point. The rasper extends to within 0.2 mm. of the base of the segment. The piercer measures about 0.62 mm. long by 0.1 mm. at its widest point. The oviduct opens about 0.14 mm. from the apex of piercer. The piercer is sharp-pointed (fig. 11, *b*) and apparently has two pairs of tiny pre-apical setae. Length: body and wings, 2.5-3 mm.

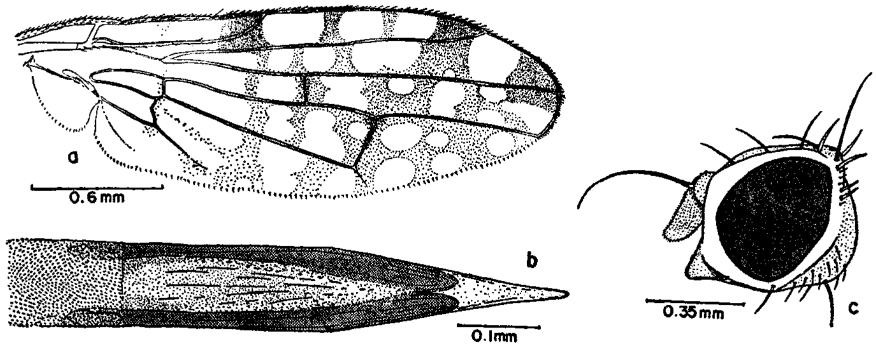


FIGURE 11.—*Stylia sororcula:* **a,** wing; **b,** piercer of ovipositor; **c,** head, lateral view.

DISTRIBUTION: Widespread throughout the tropics and subtropics of the world. Bonin Is., southern Mariana Is.

BONIN IS. CHICHI JIMA: Miyanohama, Aug. 1934 (Okabe and Ikeda).

S. MARIANA IS. GUAM: Mt. Alifan, Apr. 1946, Krauss; Potts Junction, Oct. 1952, Krauss; Pt. Oca, May 1945, Bohart and Gressitt.

HOSTS: This is a seed-infester; it lives in the flower heads of *Bidens, Coreopsis,* and other composites.

Genus **Platensina** Enderlein

Platensina Enderlein, 1911, Zool. Jahrb., Abt. Syst. **31**(3): 453.

This genus is distinguished from other Tephritinae by its very broad wings, by the distinctive wing markings, and by the presence of two bristles at the apex of the subcostal vein. The wings are less than twice as long as broad and are widest at the m cross vein.

A dozen species of *Platensina* have been described from the Orient and southwest Pacific, and five are known from Africa.

Genotype: *Platensina sumbana* Enderlein.

14. Platensina platyptera Hendel (fig. 12, *a, b*).

Platensina platyptera Hendel, 1915, Mus. Nat. Hungarici, Ann. **13**: 461, fig. 17.

One specimen on hand appears to belong here; it fits *P. platyptera* in all details except that the halteres are yellow, not black; there are some slight

differences in the wing markings but nothing which seems of any significance. The wing shape and markings are as in figure 12, *a*. The species has been adequately described by Hendel (loc. cit.) and Shiraki [1933, Taihoku Imp. Univ., Mem. Fac. Sci. Agric. 8(2) : 311], except for the details of the ovipositor. The basal segment is just slightly longer than the last two abdominal terga combined. When fully extended (fig. 12, *b*), the ovipositor measures just over 2

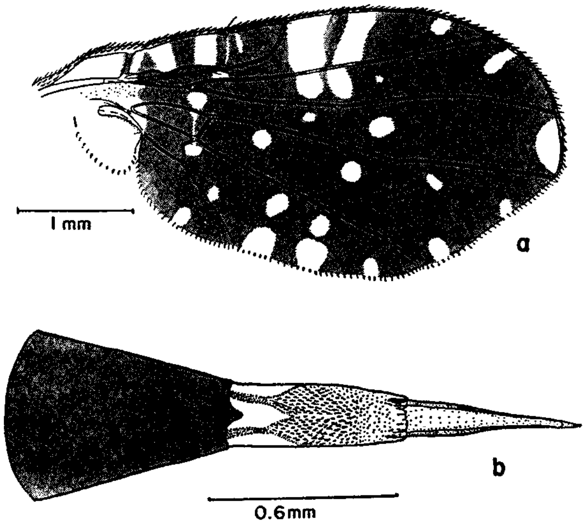


FIGURE 12.—*Platensina platyptera:* **a,** wing; **b,** ovipositor, full length.

mm. long. The basal segment is about 0.88 mm. long by 0.65 mm. wide at its broadest point. The spiracles are situated about 0.25 mm. from the anterior lateral margins of the segment. The inversion membrane measures 0.7 mm. long by 0.23 mm. at its widest point. The rasper extends to the base of the segment, but its teeth are tiny and inconspicuous on the basal third of the segment. The piercer measures 0.72 mm. long by 0.15 mm. at its widest point. It is gradually tapered from base to apex, and there are no apparent preapical setae. The opening of the oviduct is about 0.1 mm. from the apex. Length: body 2.3-2.6 mm.; wings, 2.7-3 mm.

DISTRIBUTION: Previously known only from Formosa. Southern Mariana Is.

S. MARIANA IS. GUAM: One, Pt. Oca, May 1945, G. Bohart and Gressitt.

HOST: Members of this genus infest flower heads, but no host information is available for this species.

Genus **Spathulina** Rondani

Spathulina Rondani, 1856, Dipt. Ital. Prodr. **1**: 113.

Ditricha Rondani, 1871, Soc. Ent. Ital., Boll. **3**: 163.

This is an African genus except for one species, *Spathulina acroleuca* Schiner, which is widespread over much of the world. The genus is distinguished from other Tephritinae by the predominantly black fumose wings with hyaline spots, including one spot at the apex (fig. 13, *b*), and by the location of the dorsocentral bristles which are at or slightly in front of the suture, well in front of the anterior supraalar bristles (fig. 13, *a*). Just one species is present in Micronesia.

Genotype: *Spathulina tristis* (Loew).

15. Spathulina acroleuca Schiner (fig. 13, *a-f*).

Spathulina acroleuca Schiner, 1868, Reise Novara, Diptera, 268.

This is a small, dark-colored species with largely black wings containing small, hyaline spots; the basal portion of the wing is completely hyaline. The species is readily recognized by the wing pattern (fig. 13, *b*). There is some variation in the number of spots along the anterior margin and in the size and shape of the apical spot, as well as in some of the other markings. Several synonyms in the literature have been based upon slight differences in the wing markings of some individuals. The ovipositor has not previously been described. *In situ,* the basal portion is slightly longer than the last two abdominal terga. The ovipositor is short; when fully extended (fig. 13, *c*) it measures about 2.25 mm. The basal segment is about 0.85 mm. long by 0.61 mm. measured across the anterior margin. The spiracles are situated about 0.2 mm. from the anterior lateral margins. The inversion membrane measures about 0.75 mm. long by 0.19 mm. at its widest point. The rasper extends to within 0.12 mm. of the base of the segment. The piercer measures about 0.67 mm. long by 0.15 mm. at its widest point. The oviduct opens approximately 0.2 mm. from the apex of the piercer. The apex is slender (fig. 13, *d*) and no distinct preapical setae are present. Length: body and wings, 3-3.5 mm.

Spathulina parca (Bezzi) [1913, Indian Mus. (Calcutta), Mem. **3**: 159] has been recorded from Guam (Oakley, 1939, unpublished material). This was placed as a variety of *S. acroleuca* by Bezzi. It was separated by the presence of a fuscous spot in the hyaline spot at the apex of the wing, at the end of the third vein (the dark pattern extends into the hyaline apical spot over the tip of the third vein, R_4+_5 has a narrow fuscous mark along the wing margin). Specimens are on hand from the Bonin Islands and Fiji which are typical *S. parca* (fig. 13, *e*); others show various degrees of intergradation between the two forms. We see no reason, however, to consider them different species or even different varieties from *S. acroleuca,* since considerable differences

have been seen in the wing pattern. We doubt that this character is of any value; it represents just a slight variation in the wing markings.

DISTRIBUTION: Widespread throughout Africa and Asia, extending to Australia through much of the Pacific, Indonesia, Solomon Is., New Guinea, New Caledonia, Philippine Is., Fiji, and Micronesia.

BONIN IS. CHICHI JIMA: July 1951, Bohart; July 1912, Kuwana.

N. MARIANA IS. PAGAN: Laguna-Malas, Apr. 1940, Yasumatsu and Yoshimura. ALAMAGAN: July 1951, Bohart.

S. MARIANA IS. SAIPAN: As Gonno (Asukonno), Feb. 1936, Esaki; Donni-Sadog Tasi, Garapan, Matansha-Calabera, May 1940, Yasumatsu and Yoshimura; Tapotchau, Feb. 1936, Esaki; Sept. 1944 to June 1946, Townes, Dybas, Hagen. GUAM: Numerous records from many localities, Feb. 1936 to Oct. 1952, some "reared from unknown weed," Oakley, Fullaway, Baker, Krauss, Bryan, Swezey, Maehler, Bohart, and Gressitt.

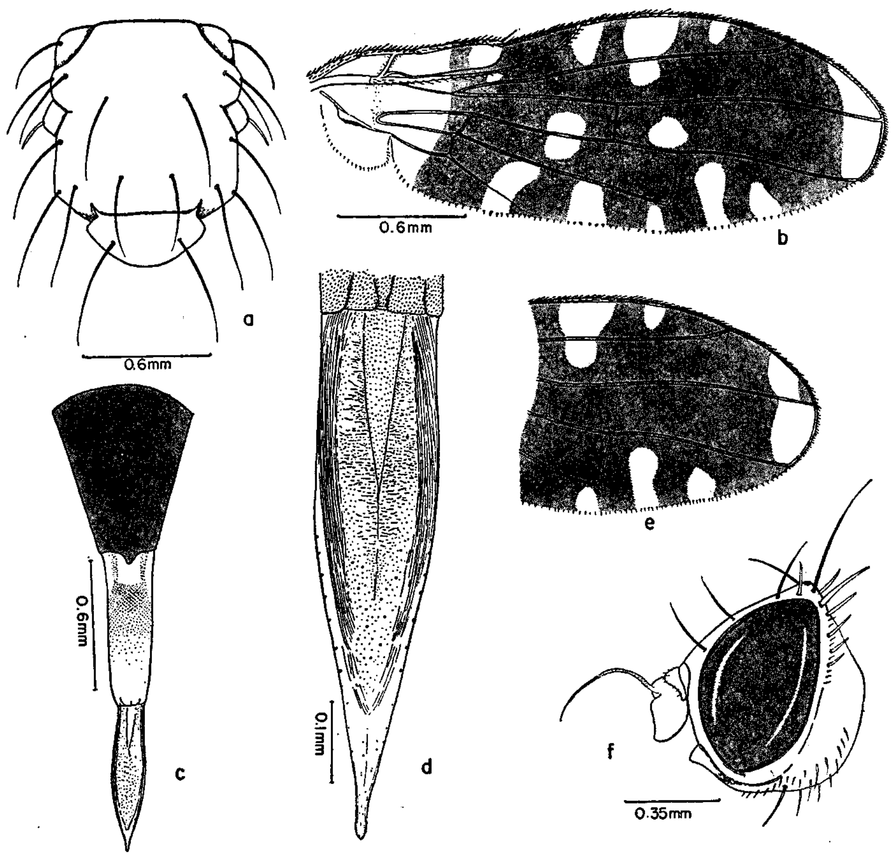


FIGURE 13.—*Spathulina acroleuca:* **a**, thorax, dorsal view; **b**, wing; **c**, ovipositor, full length; **d**, piercer; **e**, apex of wing of var. *parca;* **f**, head, lateral view.

17. Rhabdochaeta guamae Malloch (fig. 15, *a, b*).

Rhabdochaeta guamae Malloch, 1942, B. P. Bishop Mus., Bull. **172**: 204-205.

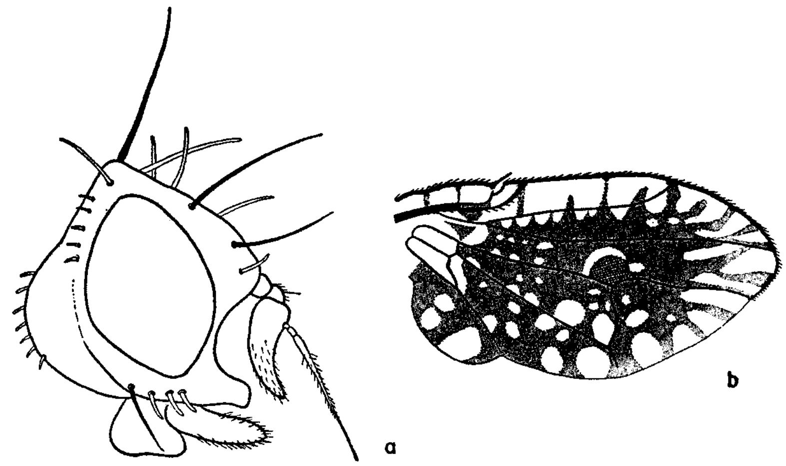


FIGURE 15.—*Rhabdochaeta guamae* (copied from Malloch's originals): **a**, head, lateral view; **b**, wing.

Since this is the only *Rhabdochaeta* known from this region, it is readily distinguished by the generic characters given above.

This predominantly yellow species is distinguished from other members of the genus by the wing markings. Three bullae are present near the median portion of the wing, one on each side of the m cross vein and one just beyond the r-m cross vein; but these are not shown in the figure. The species has been adequately described by Malloch. His figures have been reproduced here (fig. 15, *a, b*). Length: 2.7 mm.

Female unknown.

Type locality: Guam. Species known only from the type.

DISTRIBUTION: Southern Mariana Is.